

THE macdonald JOURNAL

AUGUST 1977



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THE macdonald Journal

AUGUST 1977

Macdonald Journal
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Editor: Martin van Lierop
Managing Editor: Hazel M. Clarke
Contributing Editors:
Joan Habel
Macdonald Reports
Tom Pickup
J. B. Roy, Agronome,
Information Division,
Ministry of Agriculture of Quebec
Business Manager:
Martin van Lierop

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In This Issue

Cover: Hurry up, gang, we're waiting to go for a wagon ride! See article, page 11.

Editorial	2
Vegetable Toxins	3
Macdonald Reports	5
Convocation, June 4, 1977	6
Quebec Farmers' Association: Brains, Heart, and Good Humour	11
M.A.C. Off to a Good Start	13
The Family Farm	14
This Month with the QWI	17

Journal Jottings

This year's graduates and the academic staff attending Convocation must have been gratified to hear not only the kind words spoken about Macdonald College but also, and perhaps more important, the strong emphasis that the recipient of an honorary degree, Dr. Bertrand Forest, placed on the need for continued support of agricultural institutions. Dr. Forest is Director of Research and Teaching for the Quebec Ministry of Agriculture and a comment such as "... funds for agricultural research, teaching, and extension should never be cut back from a previous level of support, but must be substantially increased for a sustained level of activity" has to be encouraging.

Dr. Forest's complete address and a list of the graduates starts on page 6 of this issue.

An example of one type of research that is being carried out is the article "Vegetable Toxins". After reading this thought-provoking piece I find that in order to satisfy my own curiosity I have several questions I would like to ask the authors. If these gentlemen have the time — and the answers — I hope I may share them with you in a future issue.

Last December the Journal ran several articles on what was, is, and will be happening at the College. One of these articles discussed the Macdonald Agriculture Campaign, a campaign to raise funds for the new Macdonald

Stewart Building. We thought it time to bring you a brief up-date on what has been accomplished in the last few months. I would think that the organizers must be pleased with the response to date, particularly from the rural areas.

On a different note, I, too, am pleased by the response to our "discussion" at the recent QWI Convention. We've been inundated with good copy and photos. As a result, if you don't see your material this month, don't despair — it will appear as soon as there is space. Thank you and please keep it coming.

Hazel M. Clarke

During the summer months, local agricultural fairs become a conspicuous part of the countryside of Quebec. Dormant during most of the year the fair grounds do spring to life and become a center of country folklore and traditions.

Many local fairs have fallen victim to the difficulties experienced by other rural institutions and some have even disappeared.

The fairs are organized strictly by local people and are operated mostly on funds generated through gate receipts which are not a reliable source because of their weather dependence. It is the devotion of a few persistent citizens who, through imagination and creativeness, have managed to put together a program so that their local fair could attract the public year after year. The fairs that have survived are beginning to be popular with the urban population, a market that most fairs failed to capitalize on from lack of publicity. Indeed a fair is a place where farmers can familiarize urban population with the products and problems of the agricultural industry.

The governments have underestimated the importance and role of local agricultural fairs within the total regional community. Both financial and moral support were persistently inadequate and contributed to the organizational and financial difficulties of the small fairs. In many cases survival of fairs is threatened unless government assistance is forthcoming.

Why is it so important to see that these small agricultural fairs are continued? A number of reasons can be given.

The local agricultural fair is very much a community endeavour, whereas the larger fairs have become highly structured. The local fair still allows the farmer to become directly involved in its organization which presents an opportunity for leadership development. Despite its modest scale, the direct participation gives the community a necessary stimulus of pride and worth. The social interaction that the fair promotes is a basic element of a healthy and vigorous community.

The fair also becomes a show-place for farmers of surrounding communities to display their best products and enter their livestock and other agricultural products in competitions, which exposes their goods to a much larger potential market. For many young farmers it is their first opportunity to compete in agricultural events which is a necessary step to gain the confidence and experience demanded of agricultural producers.

Let's participate with the organizers in our own community and continue to lobby the provincial and federal governments. Let's keep the local fairs not only for the sake of tradition but also because it plays a constructive role in our communities and agricultural industry today.

Martin van Lierop

Vegetable Toxins

by B. Bible, Calvin Chong, and
H. Y. Ju,
Department of Plant Science

The dilemma in writing about natural toxins or poisons in foods is how to convey an idea of their potential danger without creating the impression that nothing is safe to eat. Professors rush in where angels or fools fear to tread! During the past 15 years the real and sometimes imagined dangers of chemicals such as food additives, pesticides, fertilizers, etc., have been much publicized, while the dangers posed by naturally occurring toxins have attracted scant public interest. In fact, most people are surprised when informed that many fresh vegetables and some fruits contain natural toxins. Some of the most powerful toxins occur naturally in plants, and human beings have had to learn the hard way how to select plant foods which are palatable, while avoiding those which have disagreeable consequences.

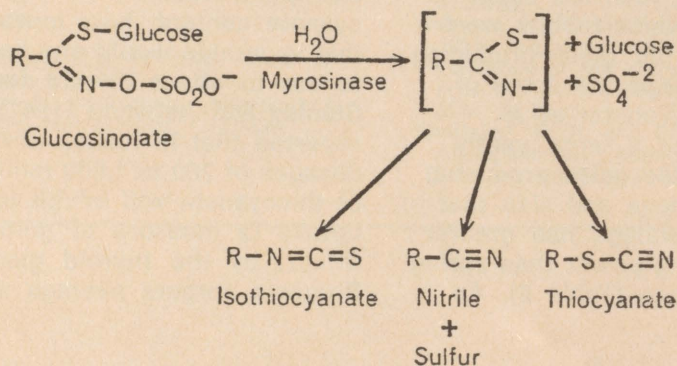
Perhaps the existence of natural toxins should not be so surprising. Since plants are unable to flee their numerous enemies, it is probable that nature has endowed them with the means to synthesize a variety of chemicals, which, because of their toxicity to insects, animals, and human beings, have permitted plants to survive in a hostile environment. Could this be the reason why green plants are dominant over much of the earth, despite the relentless attack on them by countless hungry consumers?

Plants of the Cruciferae family appear to be particularly well endowed with a chemical defense system that poses a threat to any would-be consumer. This family includes several garden vegetables such as radish, kale, rutabaga, turnip, cabbage, broccoli, cauli-

flower, Chinese cabbage, Brussels sprouts, cress, kohlrabi, and mustard. These vegetables all contain non-toxic thioglucosides which are enzymatically converted to toxic compounds, such as thiocyanate, isothiocyanates (mustard oils), nitriles, and thiooxalidones, when the plant's tissues are ruptured. In other words, the intact vegetable has a very low toxin content, but when it is being chewed, chopped up, or otherwise damaged the toxins are automatically released.

certain age groups. Furthermore, according to the survey, incidence of goiter seems to be related to consumption of cruciferous vegetables amongst certain ethnic groups.

Thiocyanate, because of its known toxicity and almost universal presence in cruciferous vegetables, makes a very interesting subject for study. Although the role of thiocyanate as a goiter causing agent remains controversial, there is little doubt that it can



This subtle mechanism is compounded by the ability of some of these toxins such as thiocyanate and thiooxalidones to adversely affect the function of the thyroid gland in animals and man. Relatively small amounts of thiocyanate and the more potent thiooxalidones can cause the disfiguring enlargement of the thyroid known as goiter. The thyroid under the influence of these natural goiterogens produces too little hormone. This causes the body's metabolism to slow down to subnormal levels resulting in a disorder commonly called hypothyroidism. Goiter disease continues to be of world-wide concern despite the widespread use of iodized table salt. The recent Nutrition Canada survey revealed a surprising amount of moderate goiter in the population, particularly among women in

cause goiter if taken in large doses. As shown in Table 1 we found that Brussels sprouts, Chinese cabbage, cauliflower, and broccoli have high contents of thiocyanate, whereas radish and kale have much lower contents. These data together with other evidence indicate genetic control of thiocyanate in these vegetables, which means that these toxins can be eliminated or considerably reduced by plant breedings as has been demonstrated in the case of rapeseed.

The environmental conditions during the growing season also influence toxin build-up as shown by the large difference in thiocyanate content between cabbages grown in 1974 compared to those grown in 1975 (Table 1). We also can point out an

Table 1. Thiocyanate content in cruciferous vegetables

Crop	Number of varieties examined	Mean thiocyanate content of edible part (micrograms per gram dry weight)
Radish.....	14	140
Kale.....	1	175
Rutabaga.....	5	250
Turnip.....	11	275
Cabbage (1974).....	14	295
Cabbage (1975).....	14	575
Broccoli.....	6	830
Cauliflower.....	10	1030
Chinese cabbage.....	3	1040
Brussels sprouts.....	7	2160

intriguing relationship between an experiment reported about 45 years ago in which rabbits were used to test the goiter-producing power of cabbage and some of our findings. Webster *et al.* (1931) reported a large yearly difference in the goiter-producing power of cabbage and also that fall or late cabbage had greater goiter-producing power than spring or early cabbage (Table 2). As

Taking Brussels sprouts as an example because of its high thiocyanate content, how much of this vegetable would one have to eat to affect thyroid function? Stanley and Astwood (1947) reported that in human patients dosages of 200 to 1,000 milligrams of thiocyanate will inhibit iodine uptake (a measure of goitrogenic effect) by the thyroid gland. Brussels sprouts average about

Table 2. Yearly variation in goiter producing power of cabbage

Thyroid weight of rabbits in grams					
1927		1928		1929	
Fall	Spring	Fall	Spring	Fall	Spring
1.19	0.58	0.80	0.61	0.76	0.68

Webster, B., *et al.* 1931. *J. Exper. Med.* 53:81-91

mentioned above, we found a large yearly variation in thiocyanate content of cabbage and, furthermore, late cabbage varieties almost always have higher thiocyanate contents than early varieties. At the time Webster *et al.* published their work the goiterogenicity of thiocyanate had not been established.

Table 3. Effect of boiling¹ on thiocyanate content of Brussels sprouts

Variety	Treatment	Thiocyanate (micrograms per gram dry weight)
Green Pearl	Fresh	1965
	Boiled	185
Indra	Fresh	1910
	Boiled	210

¹Samples were incubated in boiling water for 10 minutes

2,100 micrograms thiocyanate per gram dry weight of sprouts or 2.1 milligrams per gram dry weight. Therefore, to get a dose of 200 milligrams of thiocyanate one must consume about 100 grams of dried sprouts or 1,000 grams (2.2 pounds) of fresh sprouts. Obviously very few people eat 2.2 pounds of Brussels sprouts daily; however, one must take into account consumption of other cruciferous vegetables which contain several toxins in addition to thiocyanate. To this must be added other sources of thiocyanate in the diet. All things considered, the safety margin appears slender indeed.

At this point, some readers must be protesting, can this really be true, everyone knows fresh vegetables are natural foods full of vitamins, minerals, and other wholesome things and, after all, human beings have been eating vegetables for thousands of years with no apparent ill effects. In fact, an age old innovation called cooking does increase the safety margin very considerably. Leopold and Ardrey (1972) pointed out that the rapid expansion of man, beginning some 40,000 years ago, coincided with the development of cooking since it greatly extended food supplies by removing and destroy-

ing natural toxins. Note in Table 3 that boiling Brussels sprouts reduces the amount of thiocyanate formed by about 90 per cent.

It is probably safe to say that we are constantly consuming natural toxins some of which our body defences easily dispatch; others not so easily handled may be adversely affecting our health. One other curious result of a greater knowledge about natural toxins is that it increases one's skepticism about the concepts used to determine the safety of "man-made" chemicals. For these chemicals, the argument is made that the safety factor must be 500, 1,000, or even 10,000 fold the normal daily intake. If these criteria were used to ascertain the safety of natural

toxins in fresh vegetables, many of them would most certainly be banned as unfit for human consumption. However, unlike chemicals which are added to foods, natural toxins cannot be legislated out of existence. Thus, is it consistent that present government regulation chooses to ignore natural toxins and pragmatically condones the use of tobacco and alcohol while scrutinizing with a jeweller's eye certain "man-made" chemicals?

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Macdonald Reports

by Joan Habel

Macdonald College Studies Blackbirds

Those destructive blackbirds are back to eat our corn for yet another season, but take heart — researchers at Macdonald College are working this summer to try to find some answers to the blackbird problem.

BUT THEY NEED THE FARMERS' HELP! Have you seen large flocks of blackbirds congregating night after night in the same spot, just prior to darkness? Then you have probably located a blackbird roost and the Macdonald scientists would like to know about it.

Blackbird research takes a new turn this summer as a group of workers at Macdonald College begin studies on their movements, feeding habits, and total populations. The work will consist of trapping large numbers (thousands) of blackbirds — redwings, starlings, cowbirds, and grackles — with the aid of a light trap (a large device designed by a group of biologists at Macdonald College). Research assistants will also be watching how far birds move from their roosts and why they eat in certain fields, but not in others.

The key to this study is to find all roosts situated in Quebec. If there is a roost in your area you

are probably already aware of it. Blackbirds begin to congregate, often in low shrubs or cattails, around sunset; they are very noisy at this time. Towards the end of the day, flocks may be seen heading to the roost and the closer they get to it, the greater will be the number and frequency of the flocks. If you know of a roost or know of an area where the above conditions prevail, i.e., large flocks frequently flying overhead near dark, please contact:

Bob Clark
c/o Box 500
Macdonald College, P.Q.
H0A 1C0
(514) 457-6580 local 254

Macdonald Reports

CONVOCATION, JUNE 4, 1977

Honorary Degree:

Mr. Chancellor, it is my honour and privilege to present to you, and to this Convocation, Dr. Bertrand Forest, agronome, directeur général de la Recherche et de l'Enseignement au Ministère de l'Agriculture du Québec.

Natif du comté d'Yamaska, il a grandi sur la ferme paternelle. Il y a sans doute développé le goût de l'agriculture et surtout de l'horticulture, ce qui le décida de faire carrière en agronomie.

Le Dr. Forest se dirigea donc vers la faculté d'agriculture de l'Université Laval qui lui décerna le grade de Bachelier en Sciences agronomiques en 1943. In the same year, his interest in research brought him to the Horticulture Department at Macdonald College on a Walter M. Stewart Scholarship and in 1945, McGill University conferred upon him the Master of Science degree.

Soon after graduation, Dr. Forest was appointed Research Officer with the Canada Department of Agriculture at the La Pocatière Research Station in charge of horticultural research, a post he held until 1960. While working for the Canada Department of Agriculture he completed the requirements for the Ph.D. degree at Cornell University, which was granted to him in 1956.

In 1960, the Quebec Ministry of Agriculture felt it necessary to give a new orientation to its Agricultural Research Council and called upon Bertrand Forest to act as its Technical Advisor and Secretary. He became Presi-

dent of the Council in 1962 and served until 1972 in that capacity. He continues to serve as a member. In 1962, Dr. Forest was also appointed Director of Research and Teaching for the Ministry.

Throughout his career and particularly since his involvement in the Research Council Dr. Bertrand Forest has been an ardent advocate of research for the advancement of agriculture. Through his writings, talks, and meetings he has been particularly successful in translating the sometimes abstract scientific information into a form that can be readily understood by the consumer of the products of agricultural research.

Dr. Forest has not only preached and encouraged research, he has developed strong research units in soils, plant protection, and in the stations under his direction. He also oversees the agricultural teaching programs supported by the Ministry of Agriculture in various institutions in the province.

En plus des activités déjà mentionnées, les qualités intellectuelles du Dr. Bertrand Forest le rendent très en demande par de

nombreux organismes. Il est ou a été membre de plusieurs comités tels que les comités de Coordination des Services agricoles du Québec et du Canada, le Conseil de la Recherche en économie agricole du Canada, la Commission de la Qualité de l'Environnement du Québec et j'en passe.

Dr. Forest served his profession with great dedication as President of the Order of Agrologists from 1972 to 1975 when considerable changes occurred as a result of the introduction of the Professional Code and the new Act regulating the practice of Agrology.

Mr. Chancellor, may I present to you, so that you may confer upon him the degree of Doctor of Science, *honoris causa*, Bertrand Forest, holder of the Centennial Medal of Canada for distinguished services to his country, Commander of l'Ordre du Mérite Agronomique, and an honoured graduate of this Institution.

Jean David
Associate Dean
Faculty of Agriculture

FOOD FOR ALL THROUGH MODERN SCIENTIFIC AGRICULTURE

Thirty-four years have passed since I first came to Macdonald College to undertake postgraduate studies leading to a Master of Science Degree in Agricultural Science. This institution's standards of excellence in research, teaching, and extension were by then well established.

Since my graduation, I have al-

ways been interested in its endeavours, and I have kept in close contact with its activities. There is a "Macdonald connection" that does not end with graduation, a connection that is permanent and involves much more than an official interest.

In recent years, it has been my privilege and challenge to

head a government service responsible for agricultural research and teaching. If I have made contributions to Quebec's agriculture, Macdonald College can claim its share today and I wish to acknowledge my debt.

Macdonald College Achievements

Many changes have taken place during this period which has witnessed the consolidation and modernization of research and teaching facilities. We can even foresee a bright future for Macdonald's Faculty of Agriculture with the construction of a major building, increased enrolments in the degree course, a diploma program fully expanding and sponsored by the Quebec Ministry of Agriculture.

The contributions of Macdonald College to agriculture in Quebec and Canada have been outstanding, and its distinguished record of service constitutes the assurance that it will live up to its motto "Mastery for Service". I know that the College will meet the challenge. Macdonald's prime objective has always been the best possible teaching, research, and community service. We can take pride in the achievements over the years. The innovative spirit and the strength of its research and teaching programs are the underlying forces of its continuing development.

Yet there could be significant obstacles ahead if private and government research funds are reduced. Increased costs may prevent the Faculty from achieving its aims and overcoming financial problems. As graduates we must be concerned with what will happen and express our views on the importance of higher education and research in agriculture and food science.



Dr. Bertrand Forest

Macdonald College must continue in its tradition of leadership. It must achieve excellence in all its activities and measure its success in providing services to Quebec's agricultural industry. It is facing a tremendous challenge to continue as one of the most influential agricultural faculties. Problems and ideas in agriculture are numerous in Quebec, and thus it should be relatively easy to find ways to enhance Macdonald's prestige. There is also the mission of public service, which results from Macdonald's responsibilities as a Quebec Faculty of Agriculture and School of Food Science. "Agriculture is agriculture in any language," once stated Dr. G. Dion.

Understanding the Contributions of Scientific Agriculture

Education and research go hand in hand; alone they have no effect in ensuring agricultural abundance or increasing levels of farm productivity. It is important

to convey to the farmers and the public alike the totality of this interrelationship, the role of agricultural research and education, and the ways in which these activities lead to a better life for everyone. Agricultural extension is one of the links in the laboratory-field-consumer cycle.

The contributions of science to agriculture are not always appreciated by everyone. There is a lack of understanding of the agricultural research process and its contributions. The image of agriculture has even suffered in recent years because of the publicity given to farm surpluses and the concern about the potentially adverse effects of modern scientific farming methods on the environment.

Agricultural scientists are being unfairly judged by an environment-conscious public. When the challenge is to produce more food, they are faced with the problem of diminishing the traditional reliance on fertilizers and pesticides which have been the mainstay of increased productivity. They should not be blamed either for past failures in man-made economic and political setups.

Images of science and the scientists distorted by public emotions and politics need to be corrected. Agrologists must convince their colleagues in other professions, politicians and the public alike, that a viable agriculture is essential to our well-being, that agricultural science can make positive contributions toward alleviating starvation and improving health and nutrition. They must use every appropriate opportunity to voice their views to the public and to government officials in

any extended way either on their work or on more general matters.

The Need for New Agricultural Technology

Agricultural research has led to increased food production, thus enabling consumers to enjoy abundant food supplies at reasonable prices. Yet crop productivity must be significantly increased over its present level. At no time in recent history has the need been more crucial for new agricultural technology to increase our capacity to produce food. World-wide food reserves are low, and consumers face higher costs for all types of food.

Droughts and frosts in several countries, including ours, and other factors have diminished food supplies and raised the spectre of starvation. Crops and livestock are reaching their natural productive limits and we must find ways and means of lifting or overcoming the biological factors which hamper food production. The multiple conditions under which plants and animals are grown, changes in economic conditions, unstable climatic conditions, soil depreciation, continuous biological changes in plants, animals and their parasites all make research a never-ending necessity.

Farming is a biological process and there is nothing ever certain about the outcome. The farm is not a factory with mechanical production lines turning out food. Sometimes crops will not grow and animals will die without anyone knowing why. Indeed, at times it is even tragic that a complete crop may be lost through drought or frost, and that approximately 30 per cent of the food produced never reaches the hungry because of spoilage by pests.

Agricultural science and technology have been very important in the past and will continue to be so for many years to come. To attempt to stop, or even to

slow down, research and the tide of progress would be most detrimental to farming and other sectors of our economy. Agricultural research is not a waste of money. It is a sound investment in assuring that we can meet future needs for food. It must be supported to meet these growing challenges and generate larger returns for producers and consumers as well. It is vital to dynamic agriculture.

The Only Enduring Things

Nobody can predict with any great degree of specificity what farming will entail in the next decade, and we must capitalize on evolving technology for adequate food supplies. Looking into the future of agriculture could be a very profitable exercise, but we can do no more than surmise that some technological breakthroughs and advancements are needed and will in fact occur.

For that purpose, funds for agricultural research, teaching, and extension should never be cut back from a previous level of support, but must be substantially increased for a sustained level of activity. Almost every agricultural research leader is warning that, unless much more financial aid is made available, further discoveries and the development of new technology will be seriously hampered.

Few would ever wish to return to the old days and ways, and it would be a tragedy if we were to drift back into the past. The way to the good life is not to hold science back, but to direct it forward and adopt the social and economic means that will help to increase its application and distribute its benefits. Agricultural science and farming are part of an old problem of making two blades of grass grow where one grew before, and making them grow more and more efficiently.

Whatever the technical development in agriculture may be, one thing is certain, "our mother and

sister Earth" will remain with all her mysteries and beauty. The wonders of animal and plant life, the marvels of continuous creation so clearly evident in agriculture, these alone are timeless.

Dr. Bertrand Forest, agronome
Directeur Général de la Recherche
et de l'Enseignement
Ministère de l'Agriculture
Québec.

FACULTY OF AGRICULTURE DIPLOMA IN AGRICULTURE

Candidates presented by Professor N. C. Lawson, Director of the Diploma Course

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*Charles, Jacqueline D., Brossard, Que.,
Honours;
Crone, Robert, Westmount, Que.,
Honours;
Duncan, Michael, Ormstown, Que.;
Glaser, Charles A., Pike River, Que.;
Hlusko, Joseph, LaSalle, Que., Honours;
Horst, Gary, St. Jacobs, Ont., First
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Jorgensen, Sally, Montreal, Que.; First
Class Honours;
Lee, Laura A., Vercheres, Que., Honours;
Levain, Marc, Montreal, Que.;
*Loeffler, Michael, Montreal, Que.,
Honours;
Lyman, Annabel, Pointe Claire, Que.,
Honours;
McKenzie, Michael, Beaconsfield, Que.,
First Class Honours;
*McKinven, Alistair J., North Hatley, Que.,
Honours;
Moffett, Carol, St. Polycarpe, Que.,
Honours;
*Nevins, Margot, Pointe Claire, Que.;
Parsons, Diana, Montreal, Que., Honours;
Patry, Johanne, Vaudreuil sur le Lac,
Que., First Class Honours;
Peirce, Pirjo, Ste. Anne de Bellevue,
Que., Honours;
Roy, David M., Thurso, Que., Honours;
Ralston Purina Project Prize;
Ruel, Jacques, Ottawa, Ont., First Class
Honours; Ministry of Agriculture for
Quebec Silver Medal;
Scott, Robert, Montreal, Que.;
Sullivan, Martha A., Roxton, N.B.;
Szeto, Leonard, Ville St. Laurent, Que.,
Honours;
Taylor, Scott E., Beaconsfield, Que.;
*Walker, Susan A., Greenfield Park,
Que.

* — In absentia

DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE

Candidates presented by Professor E. S. Idziak, Director of the School of Food Science

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(Dietetics), First Class Honours;
University Scholar; Harrison Prize;

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 Stewart, Karen, Montreal, Que., (Dietetics), Honours;
 Sukhdeo, Elsa M., Ste. Anne de Bellevue, Que., (Dietetics), First Class Honours;
 White, M. Denise, St. George's, Nfld., (Food Science);
 *Wong, N. S. Nancy, Causeway Bay, Hong Kong, (Dietetics);
 Yip, H. Y. Nancy, Montreal, Que., (Dietetics), Honours;

* — In Absentia

DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE

Agricultural Sciences Division

Candidates presented by Professor S. P. Touchburn, Coordinator

Abd Ghafar, Md. Zain, Berakas, Brunei, (Plant Science);
 Abd Rani, Ahmad, Tutong, Brunei, (Plant Science);
 *Angen, Ted, Montreal, Que., (Animal Science), Honours;
 Arnkvarn, Michael B., Westmount, Que., (Agricultural Economics), Honours;
 *Baillargeon, Danielle, Val d'Or, Que., (Animal Science), Honours; University Scholar;
 *Barnaby, Bruce E., Sydney, N.S., (General Agriculture);
 Benoit, Diane, Montreal, Que., (Plant Science), First Class Honours, University Scholar;
 Blackie, James G., Florenceville, N.B., (Animal Science);
 *Bloom, Eric, St-Laurent, Que., (Animal Science); First Class Honours; University Scholar;
 Bourgon, Normand, Ottawa, Ont., (General Agriculture), Honours; University Scholar;
 Brouillette, Bernard, LaSalle, Que., (Animal Science);
 Brown, Brenda, Kirkland, Que., (Animal Science), Honours;
 Brown, John A., Sussex, N.B., (General Agriculture), Honours;
 Cadieux, Janice A., Montreal, Que., (General Agriculture), First Class Honours; University Scholar;
 *Calabotta, David F., Buffalo, N.Y. (Animal Science), Honours;
 *Carter, Clifford, Ste. Anne de Bellevue, Que., (Soil Science);
 *Clark, David K., North Sydney, N.S., (General Agriculture);
 Corriveau, Jeanne, Ste. Anne de Bellevue, Que., (Animal Science);
 Deshaies, Serge, Ste. Anne de Bellevue, Que., (General Agriculture), First Class Honours; University Scholar;
 Donkin, Alan W., Truro, N.S., (Animal Science), Honours;
 Fang, Jennifer, Baie d'Urfe, Que., (General Agriculture), Honours;
 Gadbois, Michel, St-Barnabé-Sud, Que., (Plant Science);
 Gélinas, Céline, St-Hilaire, Que., (Plant Science), Honours;
 Gendreau, Luc, Montreal, Que., (Plant Science), First Class Honours, University Scholar;
 Glick, Harvey, Ste. Anne de Bellevue, Que., (Plant Science), Honours;
 Gourley, Sheila M., Stewiacke, N.S., (General Agriculture);
 Guevin, Jose, Ste. Anne de Bellevue, Que., (General Agriculture), Honours;
 *Hoegg, B. Susan, Berthierville, Que., (Animal Science), Honours;
 *Howard, Paul F., Dartmouth, N.S., (Plant Science);
 Jamieson, Derrick R., Ste. Anne de Bellevue, Que., (General Agriculture);
 *Jefford, Roger, Conception Bay, Nfld., (General Agriculture);
 Jetten, Pierre, Stanbridge East, Que., (Plant Science), First Class Honours; Cutler Shield
 *Johnson, Pauline, Kingsbury, Que., (General Agriculture), Honours;
 *Jungesblut, Anke, Harvey Station, N.B., (General Agriculture), Honours;

Kalweit, Juergen, Chomedey, Que., (Animal Science), Honours;
 Kirby, Peter, Montreal, Que., (Soil Science), Honours;
 Lalonde, Daniel, Laval, Que., (Plant Science), Honours;
 Lane, Frank W., Truro, N.S., (General Agriculture);
 Leduc, Regent, Chateauguay, Que., (Animal Science);
 Linton, Morton S., St. Stephen-Milltown, N.B., (Animal Science);
 *Marcotte, André, Longueuil, Que., (Animal Science);
 Mascres, Catherine, Ile Perrot, Que., (Animal Science);
 Massey, Denis, Laval, Que., (Plant Science), Honours;
 McClland, Robert K. T., Cantley, Que., (General Agriculture);
 McDonald, Louise, Ste. Anne de Bellevue, Que., (Animal Science), Honours;
 Mercier, Christine, Outremont, Que., (General Agriculture), Honours;
 Mingie, David, Montreal, Que., (General Agriculture);
 Moore, Robert K., Hemmingford, Que., (Animal Science), First Class Honours; Governor General's Medal; University Scholar;
 *Murphy, Brian D., Westmount, Que., (General Agriculture);
 Nelson, James, Verdun, Que., (Animal Science), Honours;
 Nightingale, Lorraine, Rothesay, N.B., (Plant Science);
 *Palmer, Carol J., Grand Pré, N.S., (Soil Science), Honours;
 Pampalon, Gerard E., Quebec, Que., (Agricultural Economics), Honours;
 Perron, Raymond, Richmond, Que., (Animal Science), First Class Honours;
 Purenne, Robert, Montreal, Que., (General Agriculture);
 Scott, Kendall, Moncton, N.B., (Animal Science);
 Silverstone, Martin, Montreal, Que., (General Agriculture);
 *Spiller, Ron, Pointe Claire, Que., (Animal Science), Honours;
 *Stattner, Ronald, Pte. des Cascades, Que., (Animal Science), Honours;
 Stewart, Paul, Courcellette, Que., (Animal Science), Honours;
 *Taylor, Vernon, Bathurst, N.B., (General Agriculture), Honours;
 Thompson, Toni Lynn, St. John, N.B., (Soil Science);
 Vaillancourt, Daniel, Ste. Anne de Bellevue, Que., (Plant Science), Honours;
 Wright, Stanley, Fulford, Que., (Animal Science), First Class Honours; University Scholar;
 *Yusoff, Razali, Berakas, Brunei, (Plant Science), Honours;

*In Absentia

Biological Sciences Division

Candidates presented by Professor R. K. Stewart

Arscott, Deirdre, Lachine, Que., (Environmental Biology), Honours;
 Bouchard, Pierre, Beaconsfield, Que., (Environmental Biology), Honours;
 Callary, Mary P., Pincourt, Que., (Zoological Sciences), Honours;
 *Carter, Ruthann E., Ste. Anne de Bellevue, Que., (Microbiology), Honours;
 Collin, George, Montreal, Que., (Environmental Biology), First Class Honours; University Scholar;
 Dougall, Karen K., Glen Williams, Ont., (Zoological Sciences);

Hellyer, G. Brian, Pierrefonds, Que., (Microbiology), Honours;
 Hibbeln, Mary L. P., Ste. Anne de Bellevue, Que., (Environmental Biology), First Class Honours;
 Huth, Monica, Dollard des Ormeaux, Que., (Zoological Sciences), First Class Honours, University Scholar;
 Klein, Miriam, Côte St. Luc, Que., (Zoological Sciences), Honours; Lochhead Memorial Prize, University Scholar;
 Letendre, Glenn, Charny, Que., (Zoological Sciences);
 Matheson, Thomas E., Scotsburn, N.S., (Environmental Biology);
 McDowell, Gregory E., St. John, N.B., (Microbiology), Honours; University Scholar;
 *Mofford, Linda, Montreal, Que., (Microbiology), First Class Honours; Gray Book Prize; University Scholar;
 Phelan, Jane J., Fredericton, N.B., (Environmental Biology);
 Raelson, John, Ste. Anne de Bellevue, Que., (Environmental Biology), First Class Honours; University Scholar;
 *Santos, Jovina J. N., Guanabara, Brazil, (Environmental Biology), Honours;
 St. Charles, Carole, Montreal, Que., (Microbiology), Honours;
 Wong, Peter M.-C., St-Laurent, Que., (Microbiology), Honours;

* — In Absentia

Renewable Resources Development Division

Candidates presented by Professor A. R. C. Jones, Coordinator

*Bailey, Philip H., Newport, N.S., (Wildlife Resources), Honours;
 *Behrens, Ralph, Chateaugay, Que., (Agricultural Land Planning and Development), Honours;
 Bradley, Robert J., Port Elgin, N.B., (Wildlife Resources);
 Brodie, William A., Lachine, Que., (Wildlife Resources), Honours;
 Eacock, Michael C. S., Lexington, Mass., (Agricultural Land Planning and Development), Honours;
 Gagnon, Mireille, Montreal, Que., (Wildlife Resources), Honours;
 Gartner, Rosemarie, Montreal, Que., (Wildlife Resources), Honours;
 Hill, Deborah, D., Brinston, Ont., (Wildlife Resources), Honours; University Scholar;
 Kabbash, Andrew D., St-Laurent, Que., (Wildlife Resources), Honours;
 Lepage, Robert, Beaconsfield, Que., (Wildlife Resources);
 Marella, Pierino, Montreal, Que., (Agricultural Land Planning and Development), Honours;
 Morier, Gilles, Ste. Genevieve, Que., (Environmental Conservation), First Class Honours; University Scholar;
 Roberts, Peter A., Montreal, Que., (Wildlife Resources), Honours
 Shaar, Maria S., Montreal, Que., (Wildlife Resources), Honours; University Scholar;
 Stapensea, Neil, Rosemere, Que., (Agricultural Land Planning and Development), Honours;
 Stones, Ginger Ann, Shawville, Que., (Community Resource Development), Honours;
 Struger, John W., Montreal, Que., (Wildlife Resource), Honours;

Vezina, Daniel R., St-Laurent, Que., (Agricultural Land Planning and Development), Honours;
 *Viger, Bernard, Ste. Anne de Bellevue, Que., (Agricultural Land Planning and Development);
 Vipond, Grant, Montreal, Que., (Wildlife Resources);
 Wood, Christopher R., Beaufort, Que., (Wildlife Resources), Honours;

* — In Absentia

Degree of Bachelor of Science in Agricultural Engineering

Candidates presented by Professor J. R. Ogilvie, Chairman, Department of Agricultural Engineering

Beaulieu, Robert, St. Urbain, Que.,
 *Borglum, Bernard K., Penn Yan, N.Y., First Class Honours; University Scholar;
 *Damant, Christine, Baie d'Urfe, Que., Honours;
 Dehaan, Ronald K., Truro, N.S., Honours;
 *Gibson, Winston J., San Fernando, Trinidad, W.I., Honours;
 Lemay, Omer, Montreal Nord, Que., Honours;
 Leonce, Leonard, Castries, St. Lucia, W.I., Honours;
 MacKinnon, Daniel A., Montague, P.E.I.,
 Madramootoo, Chandra A., Subryanville, Georgetown, Guyana;
 *McKoy, Linvor J., St. Andrew, Jamaica, W.I.;
 Read, Keiver, Truro, N.S., Honours;
 Swinkels, Peter, Afton, N.S., Honours;
 Yeon, Daniel E., Alfred, Ont., Honours;

* — In Absentia

FACULTY OF GRADUATE STUDIES AND RESEARCH

Candidates presented by Professor Valerie M. Pasztor, Associate Dean (Records and Registration)

MASTER OF SCIENCE

Alli, Inteaz, B.Sc. (Guyana), Guyana, (Agricultural Chemistry and Physics);
 Arntfield, Susan, B.Sc., (F.Sc.) (McGill), Quebec (Agricultural Chemistry and Physics);
 Baker, Susan J., B.Sc. (F.Sc.) (McGill), Quebec (Agricultural Chemistry and Physics);
 Bedirian, Papken, B.Sc. (F.Sc.) (McGill), Syria (Agricultural Chemistry and Physics);
 Conlon, Peter D., B.Sc., (Agr.) (McGill), Quebec (Animal Science);
 Crozier, Lorne M., B.Sc. (Wilfrid Laurier), Ontario (Entomology);
 *Filadelfi, Mary Ann, B.Sc. (Loyola),

Quebec (Plant Science — Horticulture);
 Jalbert, Jacques, B.A. (Séminaire de St-Hyacinthe), B.Sc. (Laval), Quebec (Animal Science);
 Lee, Byong, H., B.Sc. (Agr.) (Kangwon Nat. Univ.) Korea (Agricultural Chemistry and Physics);
 Lemay, Roch, B.Sc. (Agr.) (McGill), Quebec (Animal Science);
 Luong, Chau Phuoc, B.Sc. (Biochem.) (Laval), Phnom Penh, Cambodia (Agricultural Chemistry and Physics);
 *Prévost, Yves A., B.Sc. (Montreal), Quebec (Renewable Resources);
 *Rowhani, Adib, B.Sc. (Pahlavi), Iran (Plant Science — Plant Pathology);
 Stewart, Gary R., B.Sc. (Agr.) (McGill), New Brunswick (Renewable Resources);
 Sukhdeo, Michael V. K., B.Sc. (McGill), Venezuela (Institute of Parasitology);

* — In Absentia

DOCTOR OF PHILOSOPHY

*Ackerman, Steven J. B.Sc. (State Univ. of N.Y.), New York N.Y. (Institute of Parasitology)
"Immunological aspects of concomitant infections with the Parasites Trichinella spiralis and Trypanosoma lewisi in the rat."
 *Di Rienzo, Joseph M. B.Sc. (Providence), U.S.A. (Microbiology)
"Studies on the lipopolysaccharide of marine bacterium."
 McDonald, Malcolm S., B.Sc. (Agr.) (McGill), M.Sc. (Alberta), Quebec (Microbiology)
"Microbial interactions-effect of Pseudomonas aeruginosa and pyocyanine on growth of Salmonella thompson."
 Muir, Derek C. G., B.Sc. (McGill), Quebec (Agricultural Chemistry and Physics)
"The Determination of Triazine Herbicides and their Degradation Products in Soils and Water from Quebec Agricultural Regions."
 Neilson, Gerald, B.Sc. (Queens), M.Sc. (Queens) Ontario (Renewable Resources)
"Soil Moisture and Runoff Relationships on a Pasture and Forest Site, Gould Lake, Ontario."
 Ng-Kwai-Hang, Kwet Fane, B.Ss. (Agr.) (McGill) Mauritius (Agricultural Chemistry and Physics)
"Isolation of Mucopolysaccharides from Tissues of the Domestic Fowl and Studies on the Uptake and Incorporation of ¹⁴C-labelled Hexosamine in vivo and in vitro."
 Seymour, Norman R., B.Sc. (Manitoba), M.Sc. (Manitoba), Nova Scotia (Renewable Resources)
"Social Aspects of Reproductive Behaviour in the Black duck (Anas rubripes) in eastern Nova Scotia"
 *Tzean, Shean-Shong, B.S. (Nat. Taiwan), M.S. (Nat. Taiwan), Taiwan (Plant Science — Plant Pathology)
"Studies on nematophagous and mycoparasitic fungi."

* — In Absentia

Brains, Heart, and Good Humour

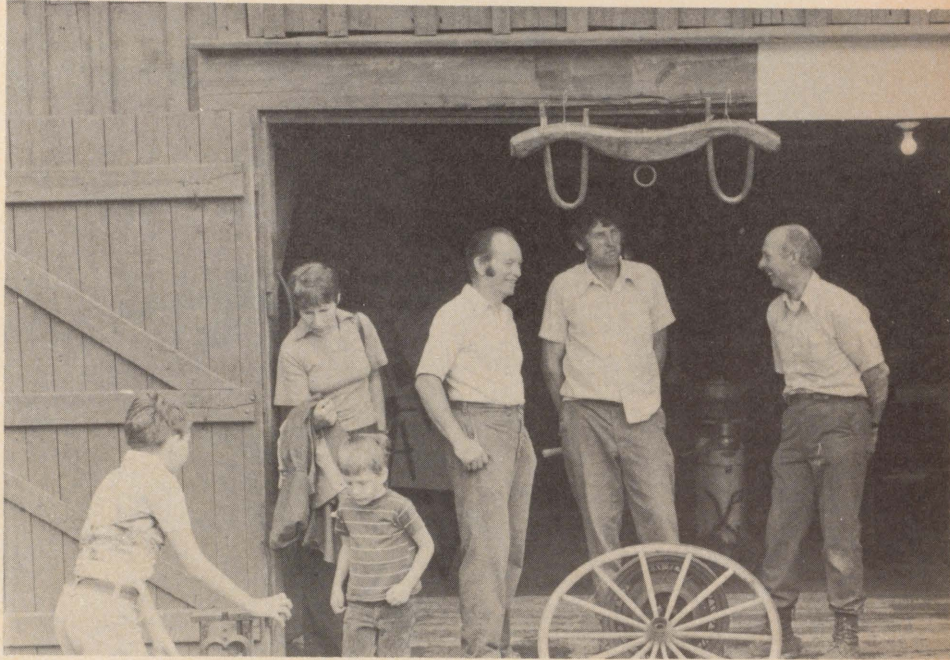
by Joan Habel

Congratulations, Q.F.A. — in nearly all parts of the province, it is a good year for this organization. A lot of very hard-working members and some pretty dedicated leaders continue to work together on new, exciting ideas for activities which help to give rural communities vitality, leadership, and togetherness.

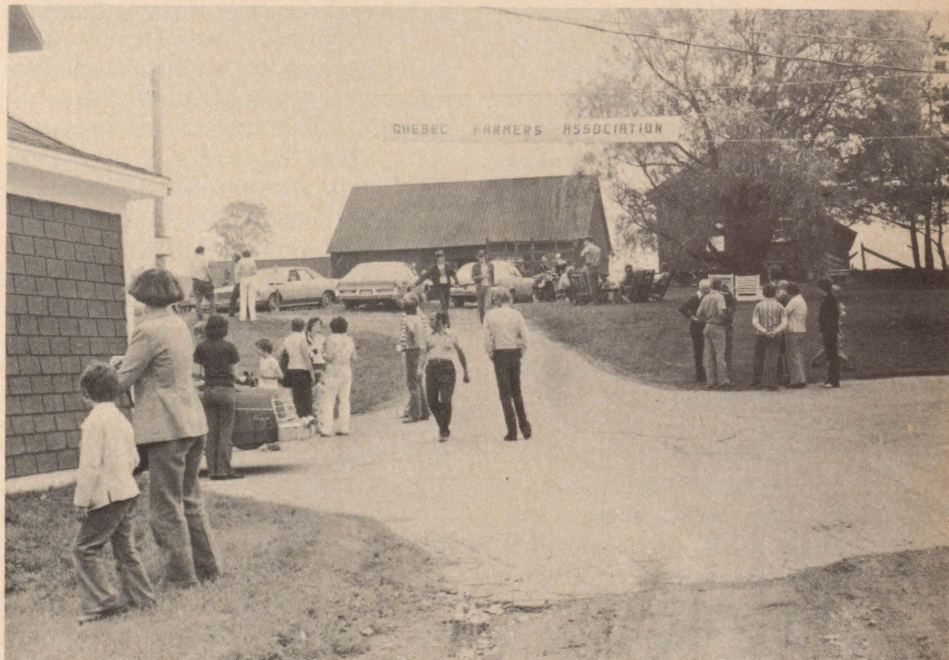
A good time to reflect on the Q.F.A.'s many recent successes was June 26, Richmond Open Farm Day Daughter Lise and I had wandered high up in Dennis Keenan's back field to take some pictures of the panorama spread out below us. Activity everywhere — an estimated 2,000 people visited the farm that Sunday to picnic, view the many excellent exhibits, look at the farm animals, watch antique and new machinery in action, go on a hayride, meet old and new friends. After two successful years in a row, it is evident that Richmond has found the right formula for a day of community and hospitality which many city and country folk enjoy.

And other regions are experiencing their triumphs, too. The new Brome-Missisquoi group found their special recipe for success this winter. Several all-day panels and workshops were held in the beautiful setting of Cowansville Golf and Country Club, covering taxation, cattle feeding, and the organization of a milking relief service. These full days offered time for interesting speakers and active discussions; they were so well received by the farmers that the membership of this group quickly grew to over the hundred mark.

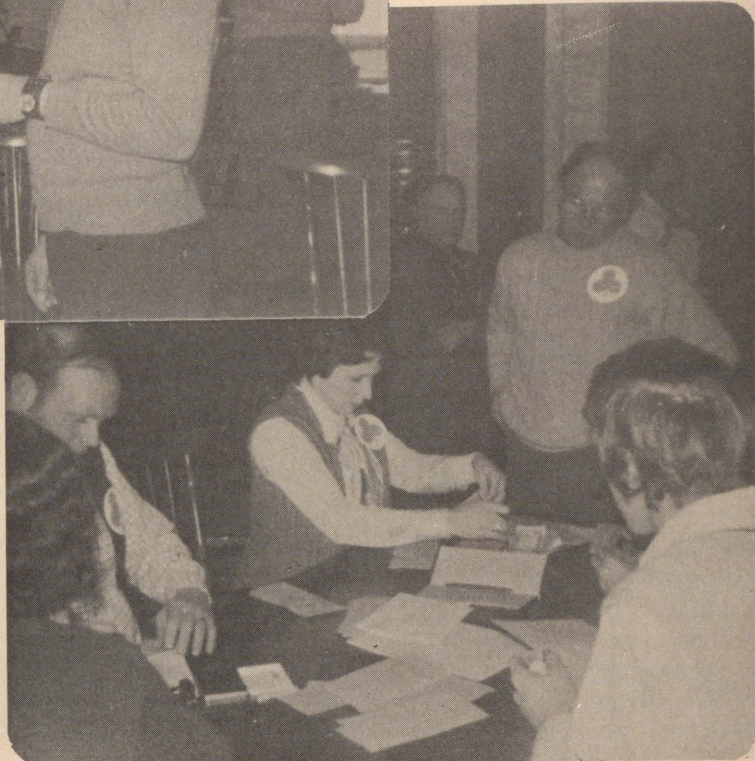
Both Chateaugay Valley and Pontiac County are slowly but surely rebuilding, looking for the



Top: The good humour is evident as host Dennis Keenan, John Boersen, and Roderick Morrison take time for a chat during the Richmond Open Farm Day activities: Below: As you turned into the driveway the Q.F.A. banner welcomed you to the hospitality beyond.



Top: Hugh Peckham and Lambert Dohmen in conversation at a Brome-Missisquoi meeting. Below: Warren Grapes and Carol Shufelt enrol George Fuller in the Q.F.A.



kinds of programs which will interest their own areas. Chateauguay have had a meeting on taxation and are holding a corn-growing contest as a summer activity. In Pontiac County, which is a vast area with long travelling distances, a successful meeting on early maturing soybeans was held, but Q.F.A. is hoping to start small groups in more localized areas, so that farmers will be able to attend meetings more conveniently. Some groups have been going strong for years. Ayer's Cliff, Bulwer, Kingsbury, and Richmond hold regular meetings for information, recreation, and project planning. These groups have found the activities which suit them, but they constantly look for new community projects, new topics for discussion, and new challenges. Along with educational meetings, their work with fair booths, scholarships, garden and corn contests, picnic grounds, benefit dances, picnics, farm days, etc., helps keep their organizations alive and well and makes a very real contribution to their communities.

One of the reasons for Q.F.A. success is that most of the members are active members. They attend meetings, they work on projects, they cheerfully give their time and energy to their organization. Add to this the excellent leadership which has emerged in almost every district, and they have a growing and successful Q.F.A. which has almost

doubled its membership in the past year. People **want** to join a forward-moving organization!

As in almost every organization there is still more to be done; more areas in which to spark enthusiasm. The Q.F.A.'s one weak spot is Lachute. Although there are several members in that area, there seems to be little interest in getting together to plan programs which would benefit both farm and community. It is felt that if Q.F.A. could find and hire a good Fieldman for Lachute area, the group might be re-activated.

The "Fieldman Project", funded by the federal Secretary of State, has proven to be a very worthwhile program. In each region, the Fieldmen have taken on a lot of the legwork, have contacted people, attended meetings, and helped out on projects, thus contributing fresh ideas and enthusiasm to their areas.

The response of neighbours and the general public to Q.F.A. activities seems to be proof positive that this group of dedicated people is on the right track in their communities. Whether one sees better crops and healthier livestock on the farm, or a crowd at a Q.F.A. fair booth knowing where to find the best hamburgers and the biggest smiles, or a big turn-out at a meeting to study the finer points of taxation, or a small family meeting at a member's home — Q.F.A. provides a large helping of the brains, heart, and good humour in our Quebec rural community.

Information on further benefits and how to join Q.F.A. can be obtained from:

Quebec Farmers' Association
Provincial Office
Box 237
Macdonald College, P.Q. H0A 1C0
Telephone (514) 457-6580, local 228

M.A.C. OFF TO A GOOD START



by Jim Feeny,
Extension Department

As of late June, the Macdonald Agriculture Campaign had collected \$4.7 million towards the \$7.2 million price tag for the new Macdonald Stewart Building on the Macdonald Campus. The Campaign organizers are very pleased with the results so far, saying that the Campaign really only started last December and is now just getting underway.

All donations to the Building Fund have come from private sources. Murray McEwen, Chairman of the Campaign, says that foundations have been especially generous but that support from other groups has played a key role in the Campaign's success to date. Cash donations have come in from all corners of the province, mostly from the Quebec Women's

Institutes and the Quebec Farmers' Association. Many people have donated time to various aspects of the Campaign, too.

The picture above shows one of the more "public" events of the Campaign. The Calf Sale was held at the Macdonald College Farm on May 29, and 25 prominent Holstein and Ayrshire breeders consigned purebred animals to the Sale. These breeders then turned one-quarter of the sale price for each animal over to the Campaign. Over \$4,000 was raised this way.

Even more successful was the Antique Auction at the Bromont Arena on June 4. The organizing committee solicited antiques and other donations from local residents, who were so generous that most of the surface of the

hockey rink was hidden by heaps of antiques. Brisk bidding was the order of the day as auctioneer Dennis Dunn brought top prices for the many articles offered. The final profit came to over \$14,000.

A Ski-a-thon was also held last winter at the Morgan Arboretum and plans are being made for more events in the months to come.

Rural groups will never raise the hundreds of thousands of dollars that corporations and foundations are being asked to contribute to the Macdonald Agricultural Campaign, but if it were not for the support at the community level, the overall Campaign could not succeed. Just as the College's activities are based in rural Quebec, so must the Macdonald Agriculture Campaign.

The Family Farm



Published in the interests of the farmers of the province by the Quebec Department of Agriculture.



CONSTRUCTION OF A VEGETABLE RESEARCH COMPLEX AT ST-HYACINTHE

Jean Garon, Quebec's Minister of Agriculture, has announced the forthcoming construction of a vegetable research complex valued at \$1,540,000 which will be integrated with the provincial agricultural research station at Saint Hyacinthe.

The science complex will include an administration building, various research facilities including laboratories, cold storage rooms and an experimental kitchen, as well as five green-houses where intensive work will be done on the selection and production of different varieties of vegetables better suited to the needs of Quebec.

Mr. Garon stressed the importance of this investment, the biggest ever in Quebec in the field of vegetable research, which is intended to increase our self-sufficiency.

Mr. Garon pointed out that no one will perfect for us the improved varieties of vegetables which we urgently need in order to reduce our dependence on imports. It is therefore essential that Quebec researchers have at their disposal the necessary means to develop new varieties. The construction of a research complex for improving and safeguarding vegetables must therefore be seen as a major step towards self-sufficiency.

The multi-disciplinary team who will work in the projected research complex has as the main task the development of new improved varieties of vegetables, not only from the point of view of quality and yield but also from

the point of view of resistance to insects and diseases. Studies will centre equally on cereal crops such as wheat and corn and on horticultural crops such as beans, tomatoes, and cucumbers.

As an example, Mr. Garon mentioned that, at present, one of the priorities of the Department's researchers is to perfect an improved variety of spring wheat which will result in greater yields and increased acreage for its production in Quebec. The new facilities will enable more intensified studies unhampered by climatic constraints.

In addition to making necessary equipment available to researchers, the construction of this research complex will enable the regrouping under the same roof of research teams from three different bodies, namely, the Saint Hyacinthe Research Station, the Sainte Martine Research

Station, and the Crop Protection Service at Saint Hyacinthe. Mr. Garon feels that this will improve efficiency and coordination of work and research from all personnel.

Mr. Garon equally stressed the contribution of this new investment to the farm education sector, since the Saint Hyacinthe Institute of Agricultural Technology, which actually houses an important number of research departments, will be able to secure the premises it urgently needs.

The building contract for the new installations was awarded to the lowest tender, Charles Gilbert Ltd. of Saint Hyacinthe. The contract is for \$1,335,945 plus additional costs of \$204,055. Mr. Garon indicated that construction must begin immediately to allow occupancy in the spring of 1978.

PRECAUTIONS TO TAKE WHEN BUYING PREFABRICATED STEEL UNITS

For the past few years, the industry producing prefabricated steel buildings has experienced a remarkable expansion in Quebec. An increase in the cost of labour and building materials has caused many farmers to turn to this type of construction. More and more they are using prefabricated steel buildings as storages, machinery sheds, workshops, sugar houses, etc.

This heavy demand has led to keen competition among suppliers with respect to prices and quality. The Farm Buildings

and Machinery Service of the Quebec Department of Agriculture would like to warn farmers who are in the market for such buildings. Most of the companies are offering satisfactory buildings but a current practice consists in selling units which do not have the minimum snow-bearing capacity prescribed in the Building Code. For example, on the market there are prefabricated structures with a load-bearing capacity of 24 pounds per square foot, when the required standards for the region are 60 pounds per square foot.

Though not dishonest, this practice may prove dangerous for the farmer who runs the risk of seeing his building collapse after only a few years. It is, however, up to the buyer to check with the dealer to ensure that the building he plans to purchase conforms to regional standards and to its intended use. Before purchasing a prefabricated structure, make sure that the model chosen is suited to its use and that it has the necessary load-bearing capacity to withstand our harsh winters. On the other hand, a small number of dealers use sale tactics which are outright fraudulent. For example, such a dealer requires a substantial down payment and fails to make delivery or delivers a unit of inferior quality.

If such is the case, contact the Farm Buildings and Machinery Service of the Quebec Department of Agriculture at 1020 route de l'Eglise, Sainte Foy, Quebec. Tel: 643-2354, or your regional advisor in rural engineering. This will help to prevent similar occurrences and perhaps completely check this type of practice.

Be very cautious when buying a prefabricated steel unit. Familiarize yourself with the regional standards of the building code with regard to the unit's load capacity of the building you are purchasing. In this way you will avoid very costly and irreparable mistakes

THE MANAGEMENT OF ALFALFA FIELDS

In order to survive and yield abundantly, alfalfa requires very precise management, right from its year of seeding and throughout subsequent years.

Year of Seeding

If the alfalfa is seeded **with a companion crop**, it is preferable to harvest the cereal in the green stage, especially in the case of lodging or excessive growth so that the legume crop may take proper root.

If the alfalfa is cultivated **without a companion crop**, a first cut is made at time of bloom. The second cut is made before or after a fall rest, depending on the growing conditions.

Subsequent Years

Three cuts can be obtained from an alfalfa field **in good condition** in certain regions of Quebec, particularly in the southwest part of the province, and two cuts in the other regions. Harvesting is done as soon as

the alfalfa begins to flower, that is **at the very start of bloom**. In this way, one obtains the maximum nutritional units per acre. Cuts are made before **September**, but the last one may be carried out after the fall rest, that is, after mid-October.

When the alfalfa field is in poor condition because it has been particularly damaged by cold, the first cut is put off until full bloom so that the damaged plants (crown and roots) may have sufficient time to restore themselves and build up good reserves.

If this procedure is followed, regrowth will be abundant. A premature cut will further weaken the plants and consequently result in lower subsequent yields and a thinner stand.

Stages of Growth

The stages of growth should be taken into consideration in determining the cutting periods. The

calendar is not a good guide since alfalfa grows at a different rate from year to year, depending on weather conditions. For example, in the Saint Hyacinthe region, alfalfa will one year be in the budding stage by June 15, while by the same date another year it will be in full bloom. Taking one year with another when haymaking is started in mid-June, yields, quality of forage, aftermath, etc., will vary considerably.

Formerly alfalfa was cut when it had reached full bloom. This stage of growth permitted highest yields and a longer-lasting alfalfa stand. However, this procedure neglected an important criterion, namely, the quality of the forage harvested. As a matter of fact, the longer the cutting is delayed, the greater the yields and, inversely, the lower the quality of the forage. As the plant ages, the fibre increases and the protein content and digestibility decrease.

Food Reserves

In order to understand how alfalfa grows under certain management, one must know the cycle of food reserves in the roots.

The plant is a factory. With the help of its leaves, it produces the food it needs for growth. From the soil it draws only water and minerals. The following diagram shows what takes place in alfalfa. Start of growth

in the spring

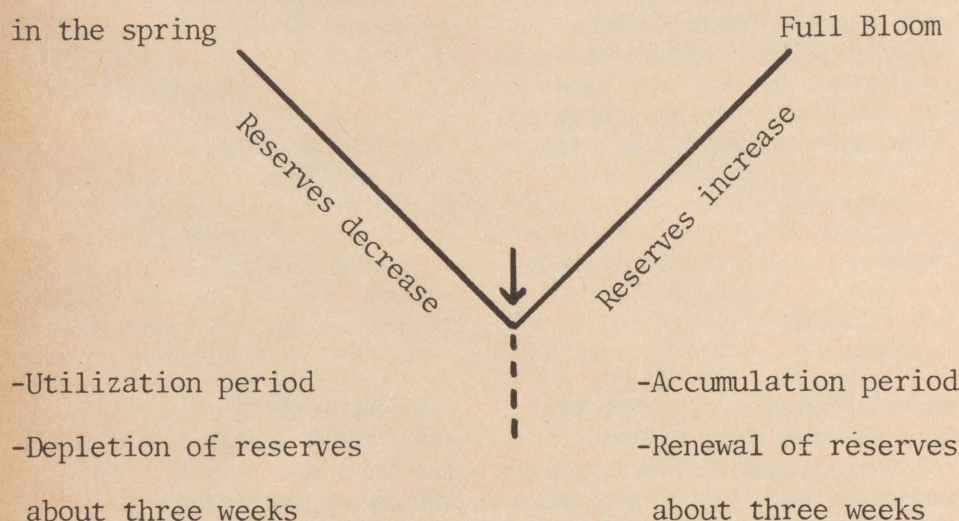


Diagram 1. Food reserve cycle in alfalfa roots.

When the plant begins to grow in the spring, it still does not have any leaves and therefore cannot produce the food it requires for growth. For its leaf formation it must therefore turn to food reserves stored in the roots the previous fall.

The dependence on root reserves continues until the alfalfa has reached a height of 8 to 10 inches. The reserves decrease; this is the utilization period.

At this stage of growth, the leaves are fairly well developed; the plant produces more food reserves than it needs. The surplus is thus carried to the roots. The reserves increase, this is the **accumulation** period. Reserves are highest at the full bloom stage.

The utilization cycle: Reserves are used up not only at spring-time, but also whenever alfalfa is harvested. By cutting the alfalfa, the factory is eliminated. It must therefore turn to its reserves in order to develop new leaves (depletion of reserves). When leaves are abundant, more food is manufactured than is actually utilized (renewal of reserves).

Reserves are at their lowest about three weeks after the start

of growth in spring and about three weeks after cutting. Cutting when reserves are low weakens the plants and slows down regrowth. Frequent cutting exhausts alfalfa. Therefore, reserves condition the life of alfalfa—its yield, vigour, duration.

The following are statistics on alfalfa yields harvested at three stages of growth, in three different locations.

Per-acre alfalfa yields in pounds of dry matter at first cutting

Stages of Growth	St-Hyacinthe	La Pocatiere	Ste-Foy
Buds.....	3,905	2,441	2,991
Early bloom.....	4,654	3,712	4,066
Full bloom.....	5,439	4,207	4,473

The longer the harvest is delayed, the higher will be the yield but the lower the quality of the forage.

Quality of alfalfa hay at Ste. Foy at first cutting

	% Protein	% Fibre	% Digestible Dry Matter
Buds.....	23.3	21.2	67.1
Early Bloom....	19.9	25.9	62.5
Full Bloom....	17.8	28.8	59.7

The fibre increases and the protein and digestibility decreases as the plant ages.

Fall Rest

Fall is a critical time for alfalfa. It must produce and store the food reserves it requires to withstand the cold, survive the winter, and start growth in the spring. It produces food as long as it has leaves. This is why from the end of August to the middle of October, the alfalfa field is left alone. No cutting at all is done during this period of about six weeks (three weeks to deplete reserves, three weeks to restore them).

The last cut at the end of summer, just before fall rest, must be made early enough to allow the alfalfa to restore its reserves before the arrival of foliage damaging frosts. If at the start of winter the alfalfa has very low reserves, its survival is doubtful.

At the end of August, a fertilizer is applied to the maintenance of the field. After the rest period, if regrowth is abundant, a crop intended as silage or green forage may be harvested in the autumn. At this time, the storing of reserves is completed and the alfalfa is in good condition for winter.

QWI

FWIC BOARD MEETINGS

Thirty-seven Women's Institute members from across Canada gathered at Carleton University, Ottawa, for the Federated Women's Institutes Board Meeting from June 20-23, 1977. Present were three voting delegates from each of the 10 provinces, as well as non-voting counsellors.

We were given a warm welcome by the National President, Mrs. Joseph Bielish of Alberta. In her report she reminded us that this was the year—the 80th Anniversary of the first Women's Institute—for celebration and for rededication to the cause. She spoke of the work of Mrs. Henia Martyniuk, as the new editor of Federated News and hoped we would make the slogan, "Every Member a Subscriber", a reality.

One evening was devoted to an Idea Fair, when information was exchanged. Each province had a display of handbooks, brochures, etc., depicting the work of the Women's Institutes.

Mrs. W. H. Warren of Manitoba gave a most interesting report of her visit to the Institutes at Ft. McPherson and Aklavik. She found that these groups are well established and are interested in a Northern Conference Workshop. She has made two visits to Hay River and, with the co-operation of the Adult Education Department, it is hoped that a Conference Workshop for the Slave Lake Area can be organized. The FWIC are to provide two resource people. This project is worthy of the support of our members.

In the Slave Lake Area, rather than being ruled by chiefs, the

people have chosen band leaders. These leaders are interested in the development of community projects.

The Educational Chairmen (the Vice-Presidents on the FWIC Executive, representing the provinces) gave full reports but noted a lack of reporting from some provinces in some areas. April 15th is the deadline for provincial reports to reach the national chairmen.

The Chairmanship of Agriculture and Canadian Industries has been changed due to the resignation of Mrs. F. Ross of Prince Edward Island. The convenership has been divided with Mrs. E. Oddie of Saskatchewan looking after Agriculture and Mrs. J. Robertson of Quebec reporting on Canadian Industries.

Plans are well underway for the next FWIC Triennium Conference to be held at the University of Saskatchewan in Saskatoon, June 21-29, 1979. Each province is asked to donate 100 articles for the customary Sale Table, each article to be valued at not more than \$10. There is to be a collection of WI handicraft of excellent quality for display purposes only (two articles per province).

FWIC delegates to the ACWW Conference in Kenya in October, 1977, will be our President, Mrs. J. Bielish of Alberta, Mrs. H.L. Noblitt of Ontario, and Mrs. J.J. Laracy of Newfoundland and Labrador.

The Tweedsmuir Committee urged that members participate in the competitions—Community History Kit, Handicraft Competition (a knitted or crocheted afghan,

45" X 60") and a Cultural Project (a painting).

The Senator Carine Wilson Citizenship Project—HOUSE LOG—is a new approach to the recording of history. Hopefully many members will resolve to undertake this project, which will remain with the house when the property changes ownership.

Gaetan Lussier, Deputy Minister of Agriculture, in the absence of Eugene Whelan, brought a brief message, which was well received. He spoke of the important role that Women's Institutes have played and will play, stating that the future of this great country, Canada, will be ensured by organizations such as ours.

He requested that we study Canada's Food Strategy Policy and voice our reaction at the World Food Conference to be held in Ottawa later in the year.

In the Adelaide Hoodless Homestead Report a plan was presented and accepted by the Board for the addition to the Home of living quarters for the curator—thus making room for a better display of the kitchen artifacts.

A banquet was held on Wednesday evening, when Mrs. J. Bielish, FWIC President, and Mrs. H. Maluske, President of the Federated Women's Institutes of Ontario, cut the Anniversary Cake. At this time an FWIC Life Membership was presented to Mrs. John Charlton, Secretary for the Adelaide Hoodless Homestead since 1960. Mrs. Ruth Jamieson, retiring National Secretary for FWIC, was also a recipient of a Life Membership.

The guest speaker for the evening was Dr. Julie Loranger, Co-ordinator for the Status of Women. Her office is ready to give assistance in promoting our aims and policies.

Mrs. R. McMillan, the National Secretary, "fiddled" the evening to a close with guitar accompaniment.

Before adjournment the Board accepted two policy statements.

1. "We, the members of the FWIC, reaffirm our belief in the family unit and its central place in our society. The FWIC has, since its beginning, recognized the importance and value of the strong family unit, and of the contribution a strong, unified family structure makes to its members, to the community, and to the nation. As an organization, a priority must be to encourage and preserve the strengthening of the family unit. 'A nation cannot rise above the level of its homes', therefore we women must work and study together to raise our homes to the highest possible level."

One suggested activity to follow up this statement was for each branch all across Canada to undertake at least one activity involving the whole family each year.

2. "Since National Unity is one of the most pressing issues facing Canada today, the FWIC reaffirm our belief in a united Canada and strongly urge our fellow Canadians to do everything in their power to appreciate our diverse cultures and to keep our nation as one."

Mrs. S. Parker,
1st Vice-President, QWI.

International Goodwill

In 1976 a request came to the **Richmond County** Women's Institute from the Q.C.W.A. in Australia for information about Canada.

A chairman was appointed and a committee brought in all the information the branches could find on Canada, our local region of Richmond, and the surrounding



The guest speaker at the Argenteuil County Annual Convention was the Hon. Francis Fox, Solicitor General. Photo by R. Tessier, courtesy "The Watchman".

area. A portfolio was compiled with information on the organizing of the Women's Institutes, maps, leading industries, historical sites, recipes, and numerous pictures of interest. This portfolio was sent to the Q.C.W.A. last September.

A letter was received from the Q.C.W.A. thanking Richmond County W.I. for the information sent to them and explaining about their Springbrook Branch of the Q.C.W.A. Recently a beautiful scarf designed with the wild flowers of Australia was sent to us in appreciation of the information received and the effort put into it. From a letter received, I quote "In studying Canada I and my members realize how little we know of your land. It is most interesting."

We are enjoying the contact we have made with the Springbrook Branch and the opportunity of sharing our activities with them.

Marion Jameson,
Chairman of Committee.

Solicitor General Guest Speaker

Over 100 W.I. members from 10 branches turned out last April 28 for the **Argenteuil County** Convention in Brownsburg where the guest speaker was the MP for the area, Solicitor General, the Hon. Francis Fox.

Mr. Fox's address covered the new legislation concerning juvenile and other offenders; the planned maximum security penitentiary at Mirabel, and the continuing issue of national unity. On the subject of the Young Offenders

Act, Mr. Fox said that he would prefer alternate forms of sentencing rather than jail for those not likely to cause physical harm to others. The alternatives could be additional power to judges to impose fines and community work orders under which offenders would have to make restitution for their actions. Mr. Fox told his audience that the federal government now spends approximately \$46 million a year on custodial handling of youthful law-breakers. It is now proposed that some of that money be spent on preventive measures.

The Solicitor General explained that the new maximum security penitentiary was being constructed as part of a phasing out program of older, over-crowded institutions.

On the subject of national unity Mr. Fox said that the time has come for all federalists to organize so that when the referendum is held, there will be a strong opposition to separatism.

This is just a brief resumé of Mr. Fox's remarks which were followed by a standing ovation from his WI audience.

Sherbrooke County's 60th

Sherbrooke County's annual meeting was held in Lennoxville on May 11 with Milby WI as hostesses. The following are just a few of the highlights. Mrs. D. Cullen, President, welcomed Provincial President Mrs. W. Coates and 2nd. Vice-President, Mrs. S. Parker to the meeting. Annual reports showed a busy

year with the school fair, making of handbags, stamps for ACWW and stamps and knitted articles for CanSave, eye glasses for UNICEF, Pennies for Friendship, Adult Education at Regional School, donation given to Hot Lunch Program at Lennoxville Elementary School, card parties were held to raise funds, members worked at the Institute booth at the Sherbrooke fair and at the Women's Centre at the Carrefour de l'Estrie.

Mrs. Coates congratuated Sherbrooke WI on their 60th Anniversary and also for planting Adelaide Hoodless roses on the lawn of the Lennoxville Town Hall and for supporting the Macdonald fund raising campaign.

A salad lunch and Anniversary cake made and decorated by Mrs. Naylor was enjoyed by all present.

Mrs. G. Decoteau
Publicity Convener
Sherbrooke County.

A Special Meeting

Beebe's May meeting (Stanstead Co.) was a double occasion affair. A chicken-pie supper with all the trimmings was served to many members and a few special guests in Wesley United Church dining-room in observance of the 55th Anniversary of the founding of the branch and to honour a member who is leaving the province.

Following the meal, a program, arranged by Miss Viola Moranville, was presented. This consisted of piano solos, singing by the Junior choir of the church, and a short but interesting history of the branch during its 55 years in existence.

A highlight of the meeting was the report of the very successful sale of Mother's Day flowers. These are made by a member in memory of her late mother, Mrs. E.G. Shepard, who was a very valuable member of the branch. Mrs. O. Palmer who is leaving the community to reside in Spencerville, Ontario, was present.



A photo taken at the Sherbrooke County May meeting shows, left to right, Mrs. K. Smart, Mrs. S. Parker, Past President, Mrs. W. Coates, Provincial President, Mrs. D. Cullen, President, Mrs. E. Marlin, 2nd Vice-President, and Mrs. H. Worster, Secretary.



Beebe WI's 55th Anniversary head table, left to right, Mrs. C. Nutbrown, Secretary, Mrs. A. Myers, Co-President, Mrs. D. Johnston, County President, Mrs. A. Young, Treasurer, and Miss V. Moranville, County Secretary.

ed with a cup and saucer as a remembrance gift from the members. In observance of the silver jubilee of the reign of Queen Elizabeth, the meeting closed with all singing, "God Save the Queen."

Mrs. Charles Aulis,
Publicity, Beebe.

Young Canada Works Project

I received the following report from Eileen Clarke, Agriculture Convener of **Grosse Isle** WI, Madalen Islands. As this branch is one of our newest ones, I thought that you would be interested in knowing that they are truly "hard at work".

The report reads, "In January 1977 we were approached to sponsor a Young Canada Works

Project, titled, 'Young Farmers Learn on the Job'. This project is to employ eight students for 10 weeks to do the following:
1. Take soil samples in over 50 landowners' soil; 2. Learn to identify different types of vegetable and field crops; 3. Help in a greenhouse; 4. Learn animal husbandry and poultry raising. The last three weeks are to be spent haymaking and operating farm machinery."

I learned at Convention that this project has been approved and is starting now!— Many thanks to this branch for encouraging our people to enter Agricultural studies.

Mrs. Joyce Asbil,
Provincial Agriculture Convener.

Dear WI Members,

This is the latter part of June, the month to which we all seem to look forward and the one about which so much has been written. But June is here, with the promising gardens, and the roses and orange blossoms. Sometimes this past month the flowers have been thirsty, so ardent gardeners have been busy. It will be August though, when this is in print, and by that time we will be reaping the benefit of this care. This is a time of weddings and of graduations also, a time of beginnings. Quite likely each of us has had the opportunity to witness either a marriage or a graduation ceremony recently. Maybe both. There is a wistful beauty in the expressions of a newly married couple, and haven't you noticed the look of promise and of hope in the misty eyes of a young graduate? I have.

Then this month we have celebrated the Silver Jubilee of Queen Elizabeth. A number of branches honoured Queen Elizabeth and it is right that we do, for both she and the Queen Mother are members of our organization. At **Lennoxville** an article was read on The Silver Jubilee, and there were pictures on hand of the Royal Family. At **Fordyce** the members joined in singing God Save the Queen, and the President, Mrs. Lewis, requested that all members fly their Canadian flags during the summer. At **Howick**, there was a display of china, pictures, scrapbooks and mementoes pertaining to the monarchy. There was one very new piece of china from the Queen's Silver Jubilee.

The majority of branches heard reports on the Provincial Convention held at Macdonald College. The delegates seemed unanimous that the days spent had been both pleasant and profitable.

I would like to recount some of the highlights from the various reports. **Hemmingford** ladies planned to buy a gift for Gabrielle, the WI's adopted daughter who

is a patient in the Douglas Hospital and whose birthday was July 5. At **Granby West** meeting a beautiful anniversary cake was served in honour of Mrs. Malcolm Crossfield who with her husband is celebrating their 25th wedding anniversary. A gift was also presented to her. A dessert card party was held by **Dunham** branch with all proceeds to go to Camp Garagona. The following is noteworthy too. A member of **Cowansville** WI, Mrs. Gibson, brought her friend, Mrs. Potts as guest. The latter belongs to the Lancaster WI in Lancaster, England. This branch has a membership of over 120. Cowansville has a pen pal who is a member of this same branch.

Melbourne Ridge entertained Cleveland and Denison's Mills branches, and Gore had been guests of the **Richmond Young Women**, when a demonstration was given on flower arrangements. **Valcartier** welcomed a new member, and to quote from their letter, "during the June meeting we decided to hold a Canada Night dance in the community centre. This will feature disco music and lunch will be served. We felt we should get in on the celebrations for this particular day — or night."

Some branches celebrated Grandmother's Day. At **Brompton Road**, grandmothers received corsages and a gift, and a contest was held with the grandmothers drawing a grandchild. Mrs. G. Decoteau won first prize and Mrs. D. Cullen won second. At **Milby** each grandmother was given a coffee mug, and special articles were read in tribute to grandmothers. A poem entitled Grandma and the Minuet, also an article which spoke of the beauty of age—while the freshness and vitality of a young face is lovely to behold, it is in the face of those who have weathered the storms and stress of life and its joys, that we see true beauty; the serenity, the wisdom, the strength of the inner soul, like the Amen to Life's Hymn of Living. Another branch honouring Grandmother's

Day was **Aubrey-Riverfield**.

The Agricultural Convener at **Dalesville-Louisa** branch arranged for a film and talk by Mr. Ray Weselowski of Vanier College who lives in the area. The material was produced by the Canadian Wildlife Service, Department of the Environment, much of which was filmed in the Northwest Territories and in the Gatineau Park area. It was most interesting and showed that the natural food chain for all animal life supported all, if not interfered with by man. Guest speaker at **Howick** was Mr. Rene Rivard, Chief Interpreter for Parks Canada, who spoke on the Battle of Chateaugay National Historic Park which will open in 1978 at Allan's Corners. **Denison's Mills** had a speaker from the Cancer Society in Drummondville, who also displayed articles used for cancer patients. At the meeting at **Dewittville**, Mrs. Primus demonstrated the making of apple strudel and cabbage rolls. Special speaker at the **East Clifton** branch meeting was Mr. Don MacMillan, agronome for Compton county, who gave information on the various government programs available to farmers.

Some roll calls reported. **Inverness** — To honour Father's Day, name the flower of your father's birthday month. **Denison's Mills**— Give a flower to your left hand neighbour. **Shipton**—Exchange a magazine with your left hand neighbour. **Shefford County**— Name an item found in stores 40 years ago, but not found now.

As usual we have some mottoes. From **Gore** branch: Every man is a story which is identical to no other, and from **Cowansville**: No race can prosper until it learns that there is as much dignity in tilling a field as in writing a poem. Then this Russian proverb speaks for itself: A mile walked with a friends has only one hundred steps.

Mrs. Gladys C. Nugent
QWI Publicity Convener.

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